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THE Commission appointed after the Patent Office fire to examine into the security of the public buildings in Washington have made a report, in which, after saying that all the public buildings except the new State Department are more or less endangered by their construction, they urge the need of a new fire-proof building for a general record-office, to which all the records of the Government can be transferred that are not needed for constant reference in their respective departments. The building, they say, should be so set apart from other buildings as not to take fire from them, and so planned as to admit of indefinite extension. They propose brick as the only fire-proof material, without claiming that even that will resist without injury the heat of large masses of combustibles in a building. They think, however, that the plan they suggest will give reasonable security to the archives. The plan strikes us as an excellent one for its purpose. It leaves untouched the question of securing the files of papers that have to be kept at hand because they are constantly wanted, which are therefore the most important, and for which provision will have to be made by improving the construction of the department buildings. But it would diminish greatly the disaster of fires in the present building, and the disaster of them when they did occur. It would also relieve the buildings of much unreasonable overcrowding, and the department clerks of much consequent inconvenience. The true policy is the careful subdivision of the records and their distribution in rooms that do not communicate, and are so small that a fire will not get dangerous headway in any of them.

WHEN the building of the new Museum of Fine Art was begun in Boston, three or four years ago, some gentlemen of that city, interested in the technical education of artists, formed a plan for establishing a school of drawing and painting in connection with the Museum. The act of incorporation had included education in the arts among the objects for which the Museum was established; and its Trustees lent a hand to the proposed school by providing suitable rooms for drawing in the basement of their building. While the building was going up, the plan of the school was maturing, money was raised by subscriptions to meet the cost of opening it and maintaining it for the first year, and a director selected; so that when in the summer of last year the Trustees, opening the Museum to the public, definitely put the rooms they had prepared at the disposal of the school, its organization was rapid. A permanent committee was appointed for its management, including four painters, three architects, and the three chief officers of the Museum. Three thousand dollars had been raised by subscription, which was afterwards increased to five thousand. Mr. Otto Grundmann, an artist of Antwerp, was engaged to take charge of the school; and was authorized to provide and bring with him the necessary casts, and other appliances for instruction. Dr. William Rimmer was engaged to direct the classes in anatomy. Eighty applicants having answered to the circulars that were sent out to invite students, the school was opened on the 2d of last January.

WE have just received the first annual report of the permanent committee, which gives a very encouraging account of the year's work. It was soon found that the number of students required another teacher in drawing. Both day and evening classes were formed, the number of students being respectively one hundred and two and forty-seven. It was intended that the school should be primarily one for professional instruction, and that whatever amateurs attended it should be required to do the same thorough work as was expected of those who aimed at becoming artists. The work was therefore laid out so as to require steady and serious effort, a minimum of three hours' attendance on five days of the week being required. It resulted, though no restrictions on entrance were fixed till it appeared that there would be more applicants than there was room for, that scarcely any pupils entered who were less than twenty years old, or who did not intend serious work; and the managers soon succeeded, they tell us, in establishing the habit of straightforward purpose-like application that distinguishes professional from amateur study. It is not surprising to learn that while the evening-classes were naturally all male, seventy-seven out of the hundred and two day-students were women. The laying-out of the course seems to have been very judicious. No classification of the scholars was attempted, nor any system of promotion by which the students were first trained exclusively in one kind of work and then passed on to another. The work of each student was changed from week to week so far as they were competent, he who was set to drawing from the life or painting one week being expected to draw from the cast the next week, for the sake of keeping him well exercised in all parts of his studies, and of averting a tendency to disdain or impatience of any part. The work included crayon-drawing from the flat (for the inexperienced), from casts of features, heads, and limbs, and from the figures and groups in the sculpture-gallery of the Museum, which were thrown open to the students, and from the life; painting from the living model, and from still life, for which again the resources of the Museum were very useful; and occasional copying of drawings of the old masters. At the end of the year some sixty of the day-students and all the evening-class applied for re-admission. On the whole, there seems reason for hearty congratulation of the authorities of the school on the success of its first year.

THE Washington *Star* makes an opportunity to advise the American Institute of Architects to mind its own business, and not to meddle with the Washington Monument. We think the Institute really did wisely in taking no action at all concerning the monument at its Convention. The proposition to interpose its advice came before it in a form likely, we think, to be met with distrust, to arouse unnecessary and perhaps irritated opposition in the body who have charge of the monument. It was a matter which required very delicate handling, and there was not time in a hurried session of the Convention to do it justice. The subject is far too serious to be complicated by personal feeling, if it can be helped. It was better then for the Institute to do nothing than to do any thing in such a way as to excite needless distrust and antagonism. There may be persons who without consideration would assume that the Institute had no concern in the matter; and that the Monument Association, or rather its officers, were the only persons whose views should be consulted, that it was their business and nobody's else. We cannot suppose, however, that these gentlemen themselves have any such idea. It is as thoroughly a public business as any political matter. The people of the country have given their money, and are asked again to give. The different States have made their official contributions; Congress itself has been appealed to, and has made an appropriation for it. The project is one in which every citizen ought to be interested, and to which he indirectly, if not directly, contributes. It is

therefore the business of every citizen; and every citizen has the same right to offer, to maintain, and to urge an opinion, as on any public measure that comes before Congress. The officers of the Monument Association are the stewards of the public in this matter; they ought to desire — we assume that they do desire — to know the judgment and the wishes of the public. The general public has given little thought to the matter, and probably has formed no opinion on it; but those who have considered it and have spoken are, we believe, pretty unanimous in condemning the present project, not merely as insecure, but as altogether unsuitable in design.

ACCORDING to the last accounts, the Monument Commission appointed by Congress have considered the report of the engineers, from which we quoted in our last issue, to the effect that there had been an error in the observations of Lieut. Kingman, and therefore no such settlement as had been reported; and their suggestion that the foundation be strengthened, the earth on which it rests being confined in a sort of caisson, to prevent its yielding. The commission have decided that the Act of Congress under which they are appointed gives them no authority to spend money in improving the foundation of the monument, nor in continuing it against the advice of the engineers; and they have therefore decided to refer the matter again to Congress. The whole subject is likely to come up afresh; and though we are glad that the Institute's Convention decided to pass it over in silence, we hope that neither the Institute, nor any one who thinks that the thing ought not to go on in its present shape, has yet said the last word.

LATE numbers of the illustrated papers, have contained wood-cuts of the design by Mr. J. C. Markham, architect, for the monument on the battle-field at Saratoga. It is a tall octagonal obelisk, with Gothic gables applied to the four cardinal faces at the bottom, bringing the base to a square, and supported by short heavy angle-buttresses. Under each gable is a large pointed arched opening divided by a heavy transom. The obelisk is banded, and lighted at three levels by spire-lights in four faces. It is in fact a Gothic spire resting on a dwarfed belfry stage, and set upon the ground with no tower under it. Only the sharp point and the finial are lacking. The idea is novel, and is carried out with considerable vigor and independence. These qualities ought not to pass without commendation in these days when so many monuments are set up which show none of them. Nevertheless the idea seems altogether wrong. A tower is as appropriate a form of monument for a battle-field as can be devised: it may have a spire or not. But to build the spire without the tower looks as unreasonable and is as unsatisfactory as the habit of fifty years ago, which we are now apt to deride, of clapping the portico of a Grecian temple indifferently on a church, a bank, a dwelling, or an out-house; and is very much of a piece with it. The New York *World* says: "It stands to reason that a spire which is well adjusted to its function as the crowning member of a tower as tall or taller than itself must undergo such modifications in proportion and in detail, as will convert it into an entirely different thing, in order to make it look well when it rises directly from the ground. This spire is set upon the ground essentially unmodified. It is fair to say that failure in an attempt to design an adequate monument to commemorate the battle of Saratoga does not by any means put the designer below the average level of his profession. It only shows that he does not rise far enough above that level to be one of possibly half a dozen architects in the State who could be intrusted with such a work with a reasonable chance of even moderate success. We can appeal confidently to the judgment of educated architects to sustain us in saying that the execution of the published design will not do credit or justice to the State, and we trust it is not too late for the committee to revise its action and take steps towards securing a better."

A SECOND attempt of the master-masons in London to supply the place of their striking workmen has failed. The stampede of the Germans we have already chronicled. Some American workmen have also been imported; but they too were "got at," and have deserted. The long wars between masters and men, all over England, are doing serious injury; and now that a system of lock-outs on the part of the masters is fairly set up against the strikes of the men, we hear much talk of the need of a habit of settling disputes by arbitration. No doubt arbitration is a great deal better than strikes and lock-outs; and, pending the discovery of some still better way out of the difficulty, it may be welcomed as a relief by the community. It is, however, but a palliative, and not likely to touch the root of the difficulty. It practically is apt to be only a compromise which brings disputants to meet each other in a half-way accommodation, but which leaves the principles in dispute undecided. It is apt, that is, to be simply a way of dodging a difficulty by common consent, and leaving it as a seed of future trouble. If arbitration were to become common, there is too much reason to fear that this is the form it would usually take. The real trouble lies far below the reach of arbitration, in the rooted antagonism of the men and their masters, and their imagined conflict of interests. It is to the study and removal of this antagonism that those who are interested must soberly address themselves, if we are to avoid future confusion, and worse.

ARCHITECTS AND CLIENTS.

THE personal relation that exists between architect and client is close enough to give full effect to differences of opinion, and therefore many occasions for forbearance, many opportunities which a lack of it may easily turn into quarrels. It is easy, and usually superfluous, to argue the importance of forbearance. Clients, however, need sometimes to be reminded that the work of an architect is in a great degree tentative, at least until his relation with his client is long-established and familiar. To adjust a given number of rooms for given uses, and to enclose them with proper materials well put together, to fit them up with prescribed appliances, — these are problems which allow of a definite enough solution. In arranging for them an architect's work is as straightforward as a mechanic's; there is no more occasion for experiments, approximations, or failures. But it is a matter of time, often of a good many experiments, to find out a client's whole wants, still more to learn how to suit his taste. The more individual and decided the client is, the more important it will be to him that his architect shall thoroughly understand his ways, at the same time that it will be a more difficult and slower, a more tentative process, to adapt a piece of work to them satisfactorily. Clients are too apt to forget that in this respect an architect's work by no means ranges with the exact sciences. They forget, too, that the wants and likings which are familiar to them by nature or habit are not necessarily those of the rest of the world, and that those which are not so are probably just the ones which it will most annoy them to have disregarded. They fail, therefore, to explain these peculiarities with due minuteness, and are disappointed, perhaps offended, when they find that the work has gone on without allowance for them. The natural temptation then is to set down the omission as a neglect of the architect. Most architects can remember a client coming to them at some time or other with a complaint something like this: "I find that my blinds have been made without rolling slats; I supposed of course that the blinds would have rolling slats." Or it may be: "Why are there no soapstone dampers in the fire-places? I never thought of having a fire-place without a soapstone damper." The architect may have answered: "You will remember that we had great difficulty in getting the cost of the house you wanted down to the limit you prescribed; in fact, we were obliged to overrun it somewhat, and you insisted on economizing wherever it was practicable. I felt obliged therefore to confine myself to what is usually considered necessary, and did not think of adding the small luxuries which increase the estimates, except where you especially required them." — "Yes," answers the client, "but I want to be comfortable; and soapstone dampers — or rolling slats — are things that I am very particular about. I never dreamed of your leaving them out."

It often happens that a client who tries to be considerate finds that his work does not go just as he would like to have it; that his architect, from failing to quite understand the client's likings, or perhaps from a little natural professional obstinacy to which the other yields here and there to avoid conflict, has done one thing after another in a way that does not quite suit till they accumulate into a serious disappointment, or what at first looks like it. This is perhaps

most likely to occur with the better class of clients and the better class of architects: that is to say, with clients who, while they have distinct preferences of their own, wish to be as considerate as possible of the convictions of their architects, and to avoid unnecessary clashing; and with architects who have strong convictions, especially where the artistic part of their work is touched, where they naturally consider themselves more instructed than their clients. Such architects are liable, in all conscientiousness, to push those convictions to the actual dissatisfaction of their clients; forgetting that they owe conformity to the ultimate wishes of the client in all cases but the extreme ones which justify them in withdrawing from his service altogether. Dissatisfaction which comes up in this way will often grow on one side till the accumulation of little disappointments seems beyond endurance; while on the other it is not so much as suspected. The client gradually comes to think that his architect is discourteously neglectful of the preferences which he has only half displayed; and when the explosion comes that is pretty sure to come at last, the surprised architect is bitterly aggrieved at the accumulation of concealed displeasure, which might, he thinks, have been avoided by a little seasonable frankness, — displeasure which the client has repressed with an idea of courteous forbearance, but which, to the architect, may seem to have been disingenuously concealed.

Misunderstandings of this kind, which are by no means uncommon, suggest one of the reasons why many men of decided notions prefer to employ builders to work for them, under their own direction, rather than commit themselves to architects. The mechanic has no convictions, unless in regard to the mechanical mysteries of his trade, where his employer cannot follow them; and, not finding them in his way, is content to leave them uncrossed. The employer, knowing that the mechanic expects to be directed, does not hesitate to watch him and follow him up with a minuteness of direction which he would not expect an architect to take in good part. He ends by securing at least the particular things on which his mind is set; and if he fails of a good many additional conveniences and elegances which the skilful adjustment of an architect would give him, he does not know it, and so does not miss them. It is the legitimate claim of an architect, that his skill enables him not only to contribute his own ideas of comfort and beauty, but to satisfy the special wants of his client, to carry out his wishes, and even whims, if need be, more successfully than another; provided he is made fully acquainted with these wants and wishes. His claim is pretty generally acknowledged nowadays, where his profession is well established; but there still are, here and there, a good many intelligent persons, who know pretty well what they want, and are just the men whom it would be to his advantage to serve, who instinctively turn rather to the builder, whom they know they can direct. It is common to lay this preference to the unpractical ways of the architect; but we suspect the real root of it is more commonly a fear of his intractability. This intractability, again, too often means simply neglect to inform himself minutely of his client's wants, — wants which the client on his part too often assumes to be general instead of peculiar to himself, and for which, though he would explain them carefully to a mechanic, he assumes that an architect would make provision without being told, if he were what an architect should be.

All these things point to the need of a thoroughly confidential relation, within the limits of his work, between an architect and his client; a relation which is not like an ordinary business negotiation, but is rather, as we have before urged, like that of a legal adviser, or family physician. Such a relation is not usually established in a moment, nor can it be always established at will between any two persons taken at random. It is therefore worth while for clients to make deliberate choice of an architect, as they do of a counsellor in law or medicine, and not be in too much haste to take advantage of professional competition. The architect once chosen, it is to the client's advantage to use the utmost freedom of consultation, and to take care that his work is not made less satisfactory by hurrying it, nor by taking for granted things that might be explained. When confidence is established he will not, if he is wise, be in haste to change his architect; but will see that one who knows his ways can continue to serve him, other things being equal, better than a new one. It is true that a man is not likely to build as many houses as he has law-questions or illnesses; but if he has once had occasion to employ an architect, it is found that he is very apt to do so again. When a confidential relation has been established, it is much better economy to continue it than to go in search of a new one. To a profession the formation of a permanent *clientèle* is always an element of stability. It tends to diminish the evils of indiscriminate competition, and gives a hold on public confidence. It gives the practitioner opportunity to study his work to the best advantage, and an assurance of reasonable remuneration, while it saves a great amount of work which may be wasted in abortive projects. Public work will naturally remain the subject of competition, but private work need not. Clients will do better in the long run to adhere to a satisfactory connection once formed, than to be diverted from it by the fascination of this or that beauty which they may admire in a neighbor's building. In this, as in other matters of professional dealing, it belongs to the architect to point the way. It is in the end profitable as well as honorable for him to show a delicate consideration to the business connections of his fellows; to address himself to a very careful study of the wants and preferences of his own clients; and especially to beware of the temptation to look upon their work as mere opportunity to carry out pet notions of his own.

THE COLORING OF WALLS.

THE men to whom we intrust our house-painting — men who have mixed colors all their lives after a fashion — do not seem to have an idea of what constitutes a hue or a shade. The mechanical dexterity displayed in their work is equal to the average in other callings; and one would think that however deficient the painter's knowledge of harmonious combinations may be when he begins to work his way up as an apprentice, he would learn to appreciate what is really good coloring, when brought in contact with it. But in this we are mistaken. Test it, if you will, by giving him a room to re-paint, — one that was originally tinted in several shades, but which, having become soiled and worn, we wish to renew. He will take your order, and the mechanical part of his work will be good; but his shades and tints will all be stronger and deeper than in the original, giving one the impression that he had resorted solely to the primaries to produce the desired effect, instead of keeping to the combinations that were once the charm of the room. The attempt to reproduce the delicate corn-color will result in a near approach to chrome yellow; and the French gray, — well, we may call it violet or light purple, for it will bear no other interpretation; while the general effect will be one of contrasts, so crude as to disturb the eye and leave upon the mind any thing but an agreeable impression. Time so employed is thrown away, — worse than that, for what is done will put us back instead of helping us on in our efforts to improve.

A woman of the Turkoman tribe, — the most ignorant of the nomads, — through the exercise of her natural taste, will weave a carpet marked by a finer combination of color than could be designed by the cleverest pupil in our art schools. Her colors will be strong, but they will not be harsh or confused in their combinations, for she knows how to balance them; and herein lies her superiority. A color that is pure and positive need not be tawdry. There is nothing vulgar in the employment of a bright knot of ribbon, neither is there any thing loud or startling in the use of polychrome; but the bright bow may be resorted to when it would be wholly out of place, and polychrome may be introduced where it would be positively ugly. It does not follow that the defect in either case may be traced to the color, but it rather comes from the mode of applying it. Nor do we escape the dilemma by resorting to tertiaries and other low tones; for even with these a discordant note may be struck, and our sense of fitness be disturbed. If one cannot swim, paddling in shallow water is but a miserable counterfeit of the noble art; and he who fears to load his palette with the primaries will make but sorry work of it when he seeks with tertiaries alone to decorate his walls.

How often have we been told that colors must be perfectly balanced and properly relieved; that masses of bright colors may be so arranged as to produce an effect the very opposite of repose; and that dark colors, unrelieved and unbalanced, will weigh us down by their heaviness! We know all this, — those of us who have given any thought to the subject, — but what is wanted is, that the many should give heed to these things — should learn to discriminate between good and bad coloring. No one ever found fault with a Persian rug for being tawdry; no one ever saw one that could come under that head; and one is yet to be seen that is not glowing with color. The splendor of the Byzantine churches has never been surpassed; their mosaics are unrivalled; and their gorgeous coloring on a gold ground is the realization of the beautiful in decorative art. St. Sophia at Constantinople, St. Mark's at Venice, and the Capella Reale at Palermo, are aglow with light and rainbow tints; yet all are in keeping and subservient to the lines of the architecture.

But what would be in keeping in some great cathedral would be wholly out of place in a smaller structure set apart for daily use. In painting and decorating a house we can only use the primaries sparingly; for if we load our walls, which are to form the background, with strong colors, what resource shall we have when we come to the selection of furniture and carpets? This is the rock on which not a few founder; and many, in trying to avoid it, run to the other extreme, — that of pale, faded, sickly, washed-out colors, void of expression, and meaningless. There must be something bright in every room, if we only know how to get it there, either on the walls or in the furniture; some decided effect, aided, strengthened, and enriched by contrasting colors, to give it life and character. We cannot confine ourselves to half a scale, and have perfect harmony. If we resort to blue, scarlet, and purple, we find there is something wanting, and not until orange is added are we satisfied. If to the blue we add brown and crimson, we must have gold or yellow to help them out. The crimson and brown together are dull, the blue does not relieve them; but when the gold is added, the effect is wholly different. And so of hundreds of other combinations. Purple and white are cold, purple and black are heavy; but purple and gold form a perfect harmony.

As I have already stated, there are hundreds of pleasing combinations that will produce a charming effect. But to those who have given the subject no attention, this is a problem hard to solve. Unaided they seldom arrive at pleasing results; and, unless one is sure of his footing, it would be better for him to take professional advice, than to run the risk of almost certain failure.

CHAMPLIN.

THE ILLUSTRATIONS.

TOWER OF THE CHÂTEAU DE GOURLAINE, NEAR NANTES, FRANCE.

THE sketch of this interesting fifteenth-century tower is taken from the *Croquis d'Architecture* of the *Intime Club.*

SKETCH FOR THE PUBLIC LIBRARY AT EASTON, MASS. MESSRS. GAMBRILL AND RICHARDSON, ARCHITECTS.

(*Gelatine Print.*)

STORE-FRONT ON ESSEX STREET, BOSTON, MASS. MESSRS. CLARKE AND DEWSON, ARCHITECTS.

CHINA PAINTING.

DURING the last few years household art and interior decoration have become as common as household words in England, and, since the Centennial exhibition, in this country. Of their various manifestations, there is no one that has been more interesting to watch in its developing than the "china craze," which has become so common throughout this country, that in many classes of society there seems to be a mania for possessing and collecting, not so much the old china, Henri Deux, old Sèvres, old Dresden, Urbino ware, Delft, Rouen, Worcester, and Lowestoft, as the more easily obtained wares of the modern English and French potteries, Doulton, Minton, Stief, Caen, Haviland, Deck of Paris. To eke out the collection, and possibly to add by contrast to the factitious art value of these works of foreign artists, there will usually be found more or less of the work of American amateurs, generally weak in intention, and crude in execution; but occasionally giving promise of good results after careful instruction, or after the teachings of individual experiment and failure.

As a natural outgrowth of this state of things, there has been a growing demand for books of instruction and treatises on the art of painting on china. This demand publishers have met in various ways; some by publishing reprints of English or translations of French and German treatises, and others by publishing compilations by non-professionals who, not writing from their own knowledge, have made mistakes which mislead the beginner, and warn the professional china-painter to mistrust the whole work. We believe the only original treatise by an American author has lately been published in Cincinnati.[1]

Like all the treatises referred to above, this little treatise of some seventy pages by Miss McLaughlin is intended only for the instruction of amateurs; and though it tells nothing that cannot be found in other works of a like character, it contains fewer errors, is less liable to mislead than many of its foregoers, is clear and concise in its directions, and contains all that is absolutely necessary for the mere beginner.

Among the things to which we take exception is the advice given to submit each article to but one firing. This may be excused by the manner in which it is at present possible to fire china in Cincinnati; but unless the simplest colors are used, and those too which fuse at the same temperature, two firings and often three are a necessity, if the decorator wishes to see his or her work gain its full finish and effect. Moreover, when gold is used it must always be applied after the first firing, and fused by a light fire. Again, if some of the directions for mixing colors were implicitly followed, the paint would be found too oily to stand the fire, and in other cases trouble would arise in putting in large flat washes from the color drying too rapidly.

As this little work professes to be merely for beginners, and not for professionals, it should be criticised only for what it professes to be, and we have found it good. We cannot help wishing that it had been a work for professional china-painters. Treatises for beginners flood the market. M. Edouard Rischgitz, for years at the head of Minton's factory, has published a little book which gives excellent directions to beginners in over-glaze painting. Mr. Sparkes of the South Kensington Museum has written a careful, easily understood pamphlet on both over and under glaze painting; also intended for beginners. These two books are at present the best, almost all the others containing the same directions, clumsily given, and confusedly arranged. What is now needed is a comprehensive work on china-painting, which shall treat the subject exhaustively; which shall go into the chemistry of the materials; shall tell the effect of fire on colors, glazes, and pastes: in short, a work which shall give concise and simple rules for the guidance of the professional artist, who, already knowing the mechanical part of his work, needs a handbook which shall save him from tedious and expensive experiment. The work which most nearly meets this want is a French work published in the early part of this century, and known, if we mistake not, as the *Manuel de la Peinture sur Porcelaine, par M. Roret.*

[1] "China-painting: a Practical Manual for the use of Amateurs in the Decoration of Hard Porcelain, by M. Louise McLaughlin. Cincinnati: Robert Clarke & Co., publishers, 1877. Price 75 cents.

CORRESPONDENCE.

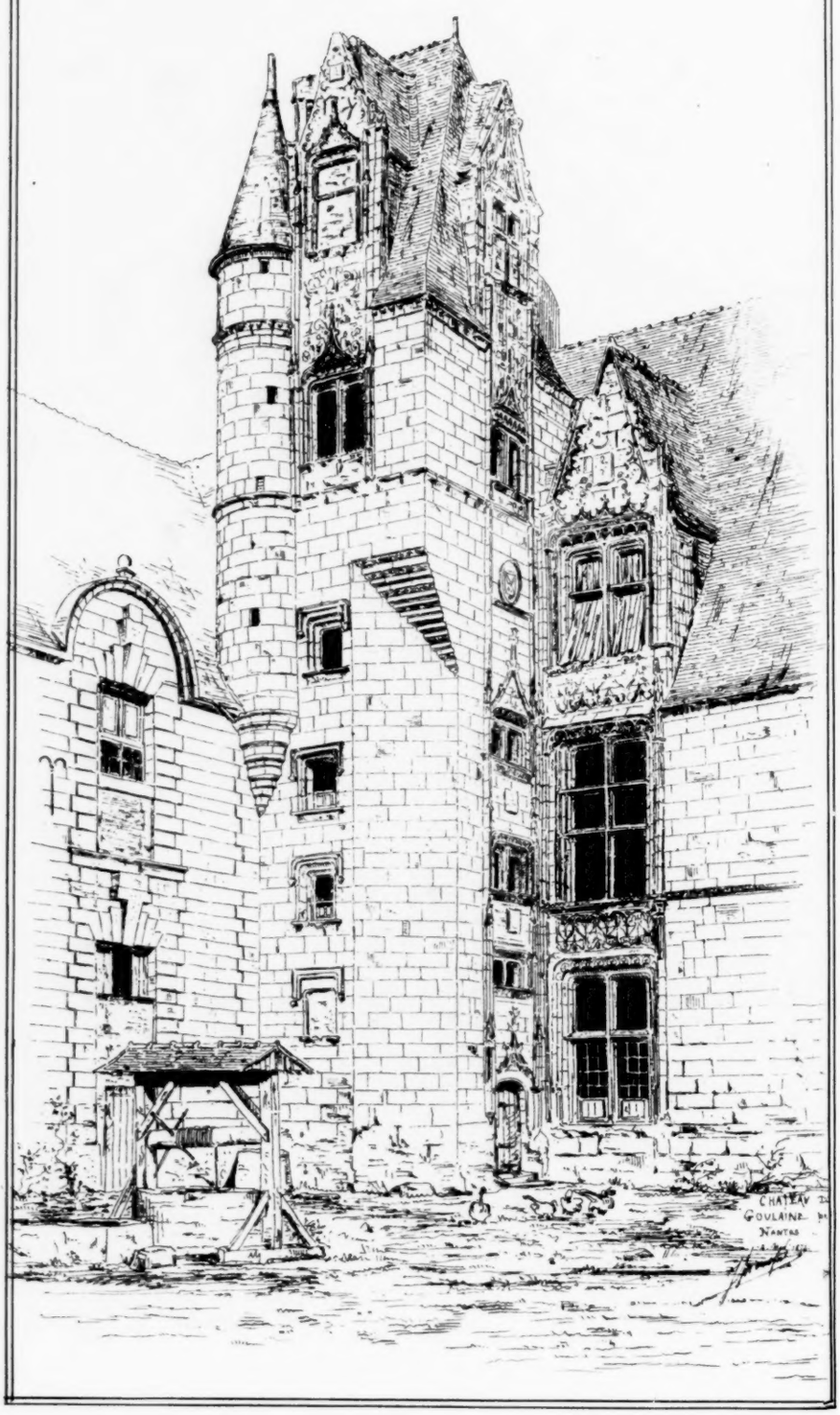
HARTFORD, CONN., Oct. 23, 1877.

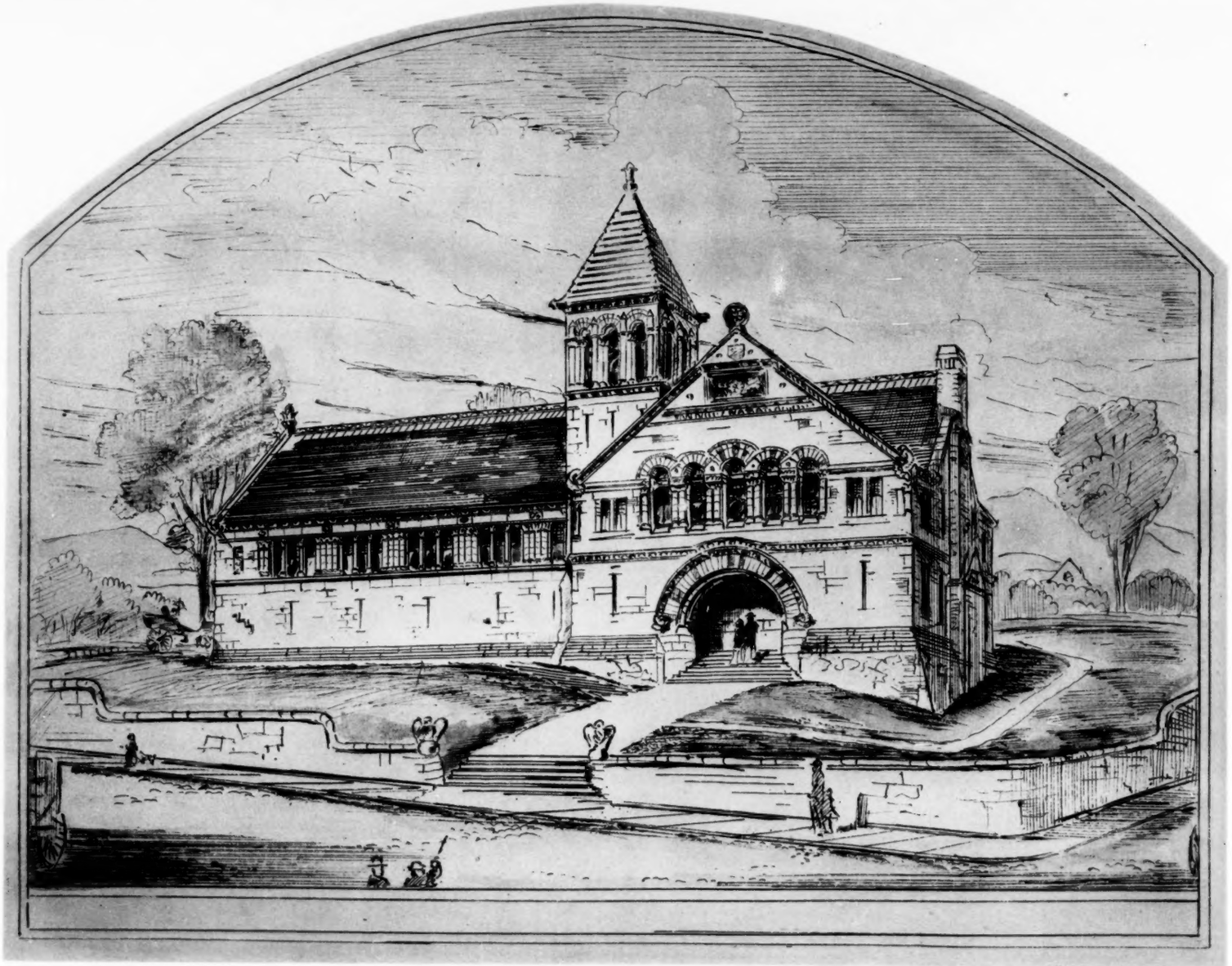
ASIDE from the lesson which this State has recently been taught of the faithlessness of public servants in a prison, the late developments open up the question of prison architecture in Connecticut. The institution at Wethersfield, a few miles below this city, was originally built in 1823, at a time when four walls, properly grated at doors and windows, were thought sufficient to detain convicts within their cells. It was a common brown stone structure 154 feet long by 43 feet wide, and 30 feet high, having four tiers of cells. In the rear were heavy brick walls, built out from the prison with a connecting wall parallel to the building, and within the space enclosed were the work-shops for the inmates of the institution. Developments of the times not only increase whatever is good and worthy, but they also devise new methods of crime, and sharpen the wits of criminals. Curious as it may at first seem, art has to keep pace with crime; and prison architecture has made rapid strides of progress within the last fifty years. This fact would have been illustrated here some time ago, had the prison commissioners carried out the plans for a State prison, which were carefully prepared by the late firm of Bryant and Rogers. There seemed, however, to have been a tendency on the part of the State to conduct affairs on the penny-wise-and-pound-foolish principle; and instead of ordering a thorough remodelling of the structure, which in some respects was beneath criticism, regarding quarters for convicts, consciences were set at rest by the raising up of the main building one story, the erection of a warden's house, and a small addition or two at other points; in fact, a "tinkering up" of the prison in place of a complete overhauling, and the building of a State prison in accordance with the advanced theories respecting the construction of this class of work. Had some of the thousands spent upon the new Capitol been devoted to this object, the State would have been the gainer, not the loser. The plans referred to comprehended a central guard-room, with cell-wings radiating therefrom, thus concentrating the important work of overseeing and guarding; the principle being the same as that set forth in the new Massachusetts State Prison, and other kindred institutions throughout the country.

The past season has witnessed the erection of several private residences which attract more than passing attention, and add not a little to the architecture of Hartford, which has been on the advance of late. Conspicuous among the new works referred to, is a wooden cottage for the Rev J. S. Davenport, just completed from plans by F. H. Kimball. The cottage embodies many new features, and presents the results of study and thought in design; and while some of its novelties are in marked contrast to the average style of house-building in Hartford, they are decidedly refreshing to the artistic eye, and illustrate the possibilities of material if correctly and judiciously handled.

The house occupies a lot in the fashionable district of the city known as the "Hill." Its front is varied by the projections of two wings, which stand out from the main line, and are harmoniously treated, one with a gable of timber-work, the other with a hip roof whose lines are broken by the introduction of a finely designed double dormer window. The windows at the sides of the house are made effective by their grouping, and the introduction of the invaluable bay windows is productive of good effects both externally and internally. The cottage is clap-boarded to the height of one story, the upper portion being ceiled. The single windows are capped by hoods; and in some instances shingles are used for ornamental purposes, notably beneath the principal gable of the main wing. The approach to the house is by means of an ample porch, simple but effective in design. The posts as well as the hand-rails are worked from the solid, and the former are relieved

Chateau de Goulaine
près Nantes



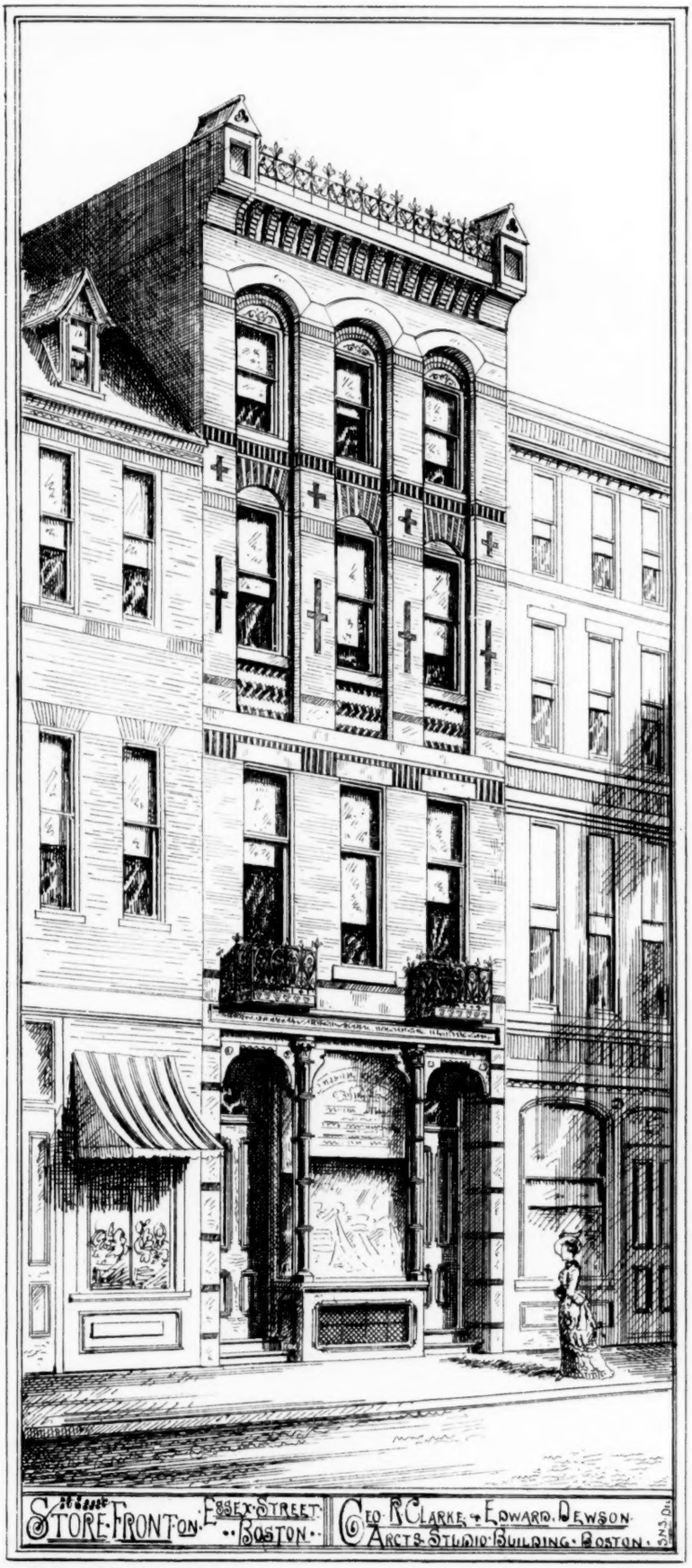


Heliotype Printing Co. Boston.

LIBRARY AT EASTON, MASS.

Messrs. Gambrill & Richardson, Architects.

American Architect and Building News, Nov. 3, 1877.



THE HELIOTYPE PRINTING CO. 330 DEVONSHIRE ST. BOSTON

of their plainness by V-lines. The piazza, which extends along the front of one wing, exhibits timber-work of the boldest description, the posts, rails, and corbels showing great solidity of construction. The cottage has steep roofs which are covered with dark slate; the ridges are crowned by a cock's-comb cresting of galvanized iron colored to represent tile. This piece of ornamentation is infinitely preferable to the ordinary iron cresting. The chimneys are laid up with red mortar, beaded brick being used at the angles. The window-sash are variously cut up for the reception of small glass, the prevailing pattern showing border-lights some two inches wide with central ones of good proportions. Externally the house has been painted a warm red, which relies upon the softening influences of time to tone it down into a desirable shade. Relief to the monotony of the color has been given by the use of black paint upon the chamfered edges of the window-casings, upon some of the members of the moulded string-courses, and elsewhere throughout the building.

The characteristic feature of the interior is the hall. It is entered by means of double oak doors whose upper panels have leaded lights of stained glass. A quadruple mullioned window with swinging sash lights the hall; and beneath are comfortable window-seats. The hall is sixteen feet square, finished in butternut, with floor of oak, and the staircase is of ash; the customary use of balusters being varied by the introduction of upright square posts with fan-shaped corbels at the intersection of the hand-rail.

The mantel and fireplace are wholly of red brick, except the shelf, which is of Ohio stone, with moulded edge. The fireplace has a pointed arch, and is ornamented by tiles. The parlor, library, and dining-room are finished in butternut, with the exception of the mantels, which are of ash, from designs by the architect, including some finely selected tiles of symbolic patterns. The rooms on the upper floor of the house have a finish of pine. The building is about 50 feet by 40, besides one wing running back 42 feet, being a part of the original house to which the additions have been made. The contract, which did not include the plumbing or the heating, was about $6,000, and is considered marvellously low in this city. The cottage is one of the most picturesque pieces of domestic architecture in Hartford.

A recent number of the *American Architect and Building News* contained a communication from the western country, extolling the virtues of the brick produced there. Here, in the little State of Connecticut, to show that something besides the proverbial nutmeg is manufactured within its borders, a trumpet might be blown in a modest way over the success attending the making of moulded brick by a Hartford firm. It is not supposed that they will rival in extent the works of some London firms whose specimens are occasionally seen in this country; but like those establishments the Hartford manufacturers have issued an illustrated circular, showing the patterns which they produce, and announcing that architects' special designs can be executed to order. In fact, the experiment is but the working-out of suggestions made by local architects; and the resultant good of the introduction of ornamental brick-work here may be traced back to the profession. From this source many good patterns were obtained, not only shapely in themselves, but designed for practical use in particular instances. But on the principle of the old proverb, the best test of the project is the demand in the market for the stock manufactued. The newer brick buildings erected in the city during the past season illustrate the use of ornamental brick in a variety of ways, and calls are being made for them in neighboring cities. There are in stock a dozen or more different patterns of these moulded brick, besides patterns for diaper-work; those designed for use in cornices, in string-courses, window-jambs, etc., embrace the "bull-nose," the "nail-head," the "ovolo," the "corner-bead," and many others as effective; perhaps the most successful patterns are those for belt-courses about a building, where excellent combinations can be produced. The enterprise of the manufacturers is to be commended; and after the brick are once thoroughly established in public favor, their use will doubtless be universal. They certainly are to be preferred for ornamental work to black brick, so popular in many cities; and without producing the striking and almost funereal effect of the latter, assert their importance in another way, abundantly making up what they may lack in color, by pleasing contour and relieving projection. With this valuable addition to the variety of material used in building, it is not impossible to produce in brick structures, comparatively speaking, a maximum of effect with a minimum of cost.

A flutter of expectation is occasionally caused among the members of the architectural fraternity in the city, by the announcement that a certain church organization is discussing the erection of an edifice, or is negotiating for an eligible site. An item to this effect appeared in print recently, stating that the Universalist Church was contemplating the purchase of some real estate owned by Trinity College, in the centre of the city; but it proved to be premature. The church which was formerly owned by the society stood upon what is now the busiest street in Hartford, and sixteen years ago it was purchased by an Episcopalian parish and removed, each stone being marked and set up in place again, about a mile from its original site; some few texts upon raised shields, which were a sort of moral eye-sore, were cut away; but with this exception, the edifice appeared the same as it left the hands of its builders. Recently some alterations have been made in the building, by means of which it now has a recessed chancel, and a comfortable vestry-room. It is known as Trinity Church, and was built from the designs of Le Fevre of New York. It is a Gothic building, and has some remarkably good details.

A house now building for Mr. T. S. Steele, in the western part of the city, was begun early last season. It occupies a corner lot, and is treated with reference to the commanding position. The house is of wood, set on costly and massive foundations of Portland stone, showing rock-face. An angle-tower is carried up at the intersection of the principal façades, and on two stories its walls are pierced by triple windows with mullioned lights; the tower is terminated by a high pointed roof. The lines of the front are broken by a projection, which is carried up and finished by a gable, displaying what might be termed "fancy" wood-work, to borrow a phrase from the builders' vocabulary. Upon the southern side of the house is a spacious *porte-cochère*, showing constructional timber-work, supported by brown-stone underpinning. This elevation shows considerable variety in the design; and the lines of the roof are broken by many dormer-windows, as well as by the roof of a large bay carried to the full height of the main buildings. The roofs are slated, and their ridges are treated to a bountiful supply of low iron railing; while the extremities of the dormers, and likewise those of the tower, and the turret upon the principal roof, bristle with iron finials of elaborate workmanship. The house exhibits much detail work, a good proportion of which is seen about the windows; but owing to its delicacy of execution it fails in the effectiveness which might have been gained by a more spirited treatment. The work has been done by contract; and for its better accomplishment a shop was built on the site by the parties interested, who are from Providence, R.I.; the various works being executed by out-of-town men. The interior of the house is conveniently planned. It will cost some $30,000.

CHETWOOD.

PLASTER CASTS.

NOT long ago the Prussian Ministry of Commerce and Manufactures offered prizes for the best and most simple methods of so treating ordinary plaster of Paris casts, by chemical or other means, as to render them capable of being washed, and at the same time to close the porous surface of the plaster, that dust might not penetrate its mass.

Plaster casts, even after having been thoroughly treated with stearin, are soluble in water to a very considerable degree. One need but tint the water with bluing, or some similar color, and the gradual softening and solution of the plaster can be readily followed by the eye. A more striking illustration is had by stirring together a thick cream of plaster with gelatine previously treated with chromic acid, and letting them harden. When soaked a while in water the plaster wholly disappears, is dissolved away, and leaves a sponge-like substance of the insoluble gelatine. From these experiments it is seen that plaster casts, though saturated with stearin, should never be washed.

A method hitherto much used is to paint the plaster with oil-color; but, apart from changing the appearance, the paint fills up the cavities, and, especially when the cast is a relief, blurs and destroys all its delicacy and exactness. On architectural plaster ornaments for interior decoration, capitals, cornices, etc., painting may be tolerated; but on all reproductions of sculpture, even a single coat of paint is inadmissible. Dr. Reissig of Darmstadt has by two different processes succeeded in transforming plaster of Paris into chemical combinations entirely insoluble, not only in water, but in warm soap-suds. The first method, simplest and cheapest, is based on the fact that sulphate of lime (plaster of Paris) is changed by baryta-water into sulphate of baryta, and a caustic lime gradually transformed by the action of the air into carbonate of lime, as we know from the similar action in plaster and mortar. Baryta-water is prepared by slacking together in a securely corked bottle, one part crystallized hydrate of baryta, with about twenty parts rain-water, thus forming a saturated solution. After it has cleared, it is sponged or is poured over the plaster as long as this continues to absorb it. If after the cast has been dried by a moderate heat, the plaster continues to accept the wash, the sponging may be repeated; but this is seldom the case. This treatment, besides hardening the cast, gives it a whiter and clearer appearance.

The second method consists in changing the sulphate of lime, by the use of a weak alkaline silicate of potash, into silicate of lime, an exceedingly hard and durable substance. To obtain the potash silicate, water containing about ten per cent of caustic potash (pure and free from iron) should be heated to the boiling point, when so much silicic acid is added as will dissolve itself therein. In cooling, pipe-clay and silicate of potash are generally precipitated in some degree. The liquid should be preserved in corked bottles until entirely clarified. Immediately before its use a small piece of pure potash should be thrown into it; or in its place, one to two per cent of potash solution may be added. The silicification itself is effected by dipping the plaster for a moment into the bath thus prepared; or, if the cast is immovable, by applying it with a sponge or an atomizer. When the surfaces to be covered

are large, the liquid may be diluted with rain-water. After the almost instantaneous chemical change has taken place, the superfluous solution should be carefully removed by washing with soap-suds. Some little experience is necessary to decide the exact time of exposure to the solution in this second method; but by practice it may soon be judged by the smoother and firmer appearance of the plaster, and by its hardness as felt by the finger-nail. The fresher the plaster, and the more porous the cast, the more quickly should the bath be employed. Casts made of old plaster cannot be silicified to advantage. After having been treated by either of these processes, plaster of Paris casts will not be in the least dissolved by washing with water or soap-suds; but, though their surfaces are no longer sulphate of lime, yet they still retain their original porous nature, and readily absorb dust and the dirty water of the first washing. To obviate this, they are finally coated with an alcoholic solution of common soap, which, after the evaporation of the alcohol, entirely stops up the pores, and much facilitates the washing. It may be prepared by dissolving one part of bar or castile soap in ten or twelve parts of alcohol; or it may be had of apothecaries under the name *spiritus saponatus*. This latter, however, is generally prepared with alcohol of a low grade. A little more expensive, but much better filling, is to be had by dissolving steatite of sodium in pure spirits of wine; this gives a really beautiful transparent tone to the plaster, and is highly to be recommended. The application of both is the same, it being necessary, if possible, to warm the cast, that the solution may be well absorbed; a repetition of the process is desirable.

With the evaporation of the alcohol the operation is completed; the cast is in effect vitrified without coating its surface.

J. T. C.

ST. THOMAS'S CHANCEL.

MR. JOHN LA FARGE has made a picture of the chancel at St. Thomas's Church, as he made a picture of the whole interior of Trinity Church, Boston. It is perhaps quite as well that he was restricted to the chancel here; decoration of the entire church would have been an extremely difficult task — a task which admitted of hardly more than the rather unsatisfactory accomplishment of obliterating and softening bad effects. And as it is, his picture is framed and focused, as it were, by the commonness and cheapness which surround it on all sides and terminate instantly when they touch it. Standing at the entrance of the nave in the sickly, lemon-hued light which there distresses one, the golden mellowness that floods the chancel is defined and emphasized as it could hardly be under other circumstances, unless, indeed, the interior architecture of the church were less complicated, confused, and pretentious, so that its entire decoration might be a unity. Enough trouble was experienced by Mr. La Farge in his treatment of the chancel only. The apse of the church is polygonal, and has five sides; it is stone to the roof, plastered within and ceiled with wood. Twenty feet from the floor perhaps are five windows, with three lancets each, and above these are traced with wooden strips apparent relieving arches, from whose points also wooden strips imitate ribs of stone vaulting and meet overhead. The point of meeting — of course there is no key-stone — is considerably above the point of the arch which separates the chancel from the nave, so that it and much of the chancel ceiling is hidden from the view of any one not within the rail. The chancel being deep and the different panels few and wide, the two extreme panels make a large surface that is either invisible or foreshortened to the observer at the farther end of the nave. The light is very high and confused; it comes in from the semicircle — let us say — of windows, and is opposed by a higher still row of gas-jets, which follows the line of the arch that bounds the chancel and is invisible to the congregation. The windows are of stained glass, now painted over, but the linear design has been necessarily preserved, of course. These are some, at least, of the mechanical difficulties with which it is apparent that Mr. La Farge has had to contend. It is well to bear them in mind in judging of the decoration. It is also well to understand that the work cannot be regarded in the same light that it could be if Mr. La Farge had simply received a commission to decorate this chancel without stipulation concerning expense.

But whatever this decoration might have been if Mr. La Farge had had none of the disadvantages that we have mentioned to contend with, and by study and patience, and hard work on his own part, and on the part of his assistants, to endeavor to overcome, — what it is already, and much more what it promises to be, is very certain. It promises to be in all respects the best piece of church decoration in America, outside of Boston; and in some respects, and in so far as it goes, better than even Mr. La Farge's similar work in Boston — more elaborate at once, and more delicate in certain regards. We say what it promises to be, because the work is not complete; its scheme includes two large paintings, one of which is unfinished, and the other not in position. The latter will be put up to-morrow, and is to occupy the two panels on the right of the chancel. It is a canvas, about twenty feet long by fifteen feet high; on the left is the tomb, "hewn out of solid rock," near which two soldiers have fallen asleep, and on which the angel is seated; on the right, the Magdalen is kneeling at the feet of Jesus, as he says, with a gently repellant gesture, "Touch me not." We can speak of it better after it has taken its place as an element of the entire decoration. The left-hand picture, which will not be ready for some time, we believe, is also a subject of the resurrection, and is to be of the three Marys to whom the two disciples are telling their strange tidings.

The centre panel is the main point of the lower decoration that visitors to the church to-day will note. The episcopal chair and the gold cross which were always here still remain. But the latter has been set into a panel of plaster upon which are sculptured in high relief kneeling angels and cherubs. On either side of the cross kneel six angels in pairs, one above another, each pair occupying a panel in the sculpture itself; two others kneel at the foot, each with a cherub below and in the corner of the work. Above is a crown; and beneath it and where the sculpture melts into the wall, hover cherubs not regularly and formally distributed, but disposed in a way which tends to give freedom and movement to the whole. On either side is a pilaster of gold and dark color, carved and inlaid with mother-of-pearl. The crown, the kneeling angels, and the floating cherubs, are painted a delicate blue and gold. Looking long at this whole piece of relief, one grows fond of it. The general design is Mr. La Farge's, of course, and is extremely poetical. Whether it is intended to symbolize any specific sentiment, we do not know. It does not need to, certainly, and may rest on itself quite confidently. Devout persons who desire symbolism that is too shadowy to seem superstitious to them may take the suggestion of the rector, Dr. Morgan, that it typifies the enwrapt contemplation of the mystery of the Cross, too high for even the angels to comprehend; "which things the angels desire to look into," if a text is needed. But in any event these angels are very lovely, very nice; unless "nice" seem in any way a depreciatory epithet. They were modelled in Paris by Mr. Aug. St. Gaudens, of this city, than whom we have no sculptor of more delicate feeling, or more refined sense of movement and grace; and they were painted by Mr. Low, whose "Reverie" observers of the best pictures in the last Academy exhibition here ought to recollect. The painting disappoints us a little. It is somewhat pale and gray, probably because Mr. Low, who is certainly a vigorous enough painter, felt the delicacy of Mr. St. Gaudens' work, and knew of the subtlety of Mr. La Farge's. Unless it assists the paintings when they are put up by acting as a kind of foil of coolness to their rich color, we may venture to hope that Mr. La Farge may accentuate it here and there. And the horizontal lines in relief must be acknowledged to give an effect of formality and rigidity — as if the angels were occupying each pair a pigeon-hole — that the rest of the design is entirely without. However, it should be borne in mind that no part of the decoration that we have hitherto spoken of is to be considered complete.

The upper decoration — we have left any word of the mouldings and pilasters till we can speak of the paintings which they will frame — consists of the five windows and their surroundings of mullions, nook-shafts, and corbelled columns; which surroundings are a deep red in harmony with the general color of the church and the ceiling. The windows are three-light traceried windows and of stained glass, painted over by Mr. La Farge and his assistant Mr. Smith, an artist whose inexperience is very measurably atoned for by his cleverness and his feeling. The linear design is, of course, preserved, as we say, and so is not to be laid at Mr. La Farge's door. In color too, he was necessarily hampered. In many instances he had no large choice, being able merely to neutralize tints that he found, and display his own art in delicacy of handling and in details. But what he has accomplished one may readily see by glancing at the rest of the stained glass in the church. This, although it may not have seemed atrocious in color heretofore, must seem atrocious now by contrast to all but the color-blind. To take such glass as Mr. La Farge found, and to make it really noble, deep, rich, mellow, beyond any thing of the kind on this side of the water, displays an ability in art which one can characterize only by saying that it is artistic ability of the very highest order.

One forgets how much of the art of painting on glass has been lost, and can easily imagine himself before some antique window in looking at the left lancets in the centre window and the one next it to the south. If we were to select beauties in this glittering emblazonry of jewels, we should take these two. The one in the centre is of the figure of St. Thomas, we presume. But it matters very little who it is. Was ever richer deep blue-green than the robe? Was ever more delicate shining opaline tint than the face and hands? And, if this seems an exaggeration of enthusiasm to the congregation of St. Thomas's, was ever lovelier mystery than that of the landscape in the next window? Is not stained glass an admirable material to show how far art is separated from literal imitation? Fancy binding a tree into a sky with color so that all sense of where the leaves end and the sky begins is lost, and the eye delighted as only the illusion of art can delight it. Try to count the different greens in these leaves; try to discover what is beneath and beyond them; try to express in words the meaning of this mysterious meaninglessness. And observe what an effect is lent to all these windows by the tenderly glowing deep topaz that the red and gold ceiling is, — and reciprocated by them. This ceiling, with its amazing soft reflections of color thrown back and forth by the inclinations of the vaulting between the blue and white ribs, is in itself a noble decorative

picture; and if the rather formal regularity of its deep blue arabesques and their not too graceful lines are detractions, they are slight enough to make one half hesitate to mention them. Mr. La Farge's picture is a unit as it stands; it is safe to say that it will not lose in unity by the hanging of his paintings. — *New York World.*

THE QUALIFICATION OF ARCHITECTS.

TO THE EDITOR OF THE AMERICAN ARCHITECT AND BUILDING NEWS.

Dear Sir, — Your suggestions and comments in a recent number of the journal, regarding the adoption of some measures whereby the public may be protected from malpractice by those professing to be architects, who in reality are not sufficiently competent, are suggestions of vital importance, not only to the public concerning life and property, but also concerning the welfare of the profession itself. But there are difficulties attending the problem of the selection of the fittest, and the exclusion of the unfit, when measured by the standard of a purely theoretical schooling alone, which would be lessened, in our opinion, if said schooling was more universally coupled with the experience of the "workshop," such as is obtained in institutes of technology, wherein theory and practice go hand in hand. The institute, however, cannot even under the best advantage extend its practical facilities to a degree equal to the every-day experience of the established architect of unquestioned ability, or of the workshop of the builder of large experience and practice. Therefore it appears to the writer, that the natural and practical way of forming conditions wherein the abilities of whoever claims to be an architect can be properly, and to the public acceptably, judged, is, for those architects who are established with reputations beyond all doubt as to their safety and efficiency, to establish a bar or barrier which shall admit or recommend to professional practice only those whom its appointed judge shall deem fully competent. The process of selection by the public would thereafter be confined to those whom it might reasonably be sure were to be trusted, at least as far as safety is concerned. It may be anticipated by some, that this would tend towards centralization of power, by which those established, and so disposed, could limit the number of practitioners, and therefore naturally enough admit but few in any city. But a second thought will convince such that this element does not really exist; for when it is understood that it requires years of study and application to be *reasonably* admissible to practice, and also years of patient waiting and working to become *established* after beginning practice on individual responsibility, then it may be assumed that the law of supply and demand will as naturally regulate this matter as the matter of merchandise.

ARCHITECT.

THE EFFECTS OF LIGHTNING.

IT is estimated that at least 45 persons are killed annually by lightning in this country. The average number of deaths by lightning has been: 22 in England, 9 in Switzerland, 3 in Belgium, and 75 in France. In France alone, during a period of 30 years, over 10,000 persons were smitten, of whom 2,252 were instantly killed. Eighty were wounded and 9 killed during one thunder-storm at Châteauneuf les Montiers in 1861; and within one week, when the air was highly charged with electricity, thirty-three fearful flashes of lightning were observed, each bringing death to some victims.

During the sixteen years between 1799 and 1816, 156 vessels of the British navy were struck by lightning, 73 men were killed and 138 injured, and the loss of materials amounted to over a million of dollars; but since the system of metallic conductors adapted for vessels, devised by Sir W. Snow Harris, has been applied to the vessels in that navy, the losses and damages by lightning have almost entirely ceased, although the number of vessels has been greatly increased.

On the night of April, 1718, twenty-four steeples were struck along the coast of Brittany; and, on the 11th of January, 1815, twelve steeples suffered a similar fate in the Rhenish provinces. On the 27th of July, 1759, lightning burnt all the woodwork of the great cathedral at Strasbourg; and on the 14th of August, 1833, it was struck three times within a quarter of an hour, and so much damaged that the repairs cost about $6,000,000. In 1835 lightning conductors were placed upon the building and steeple, and since then it has not been damaged whatever by lightning, although discharges have on several occasions occurred in line with the top of the steeple, which is 437 feet above the ground. On the 18th of August, 1769, the Tower of St. Nazaire, at Brescia, was struck, and the subterranean powder magazine, containing 2,076,000 lbs. of powder belonging to the Republic of Venice, was exploded. One-sixth of the whole town was laid in ruins and the rest very much injured, and about 3,000 persons killed.

On the 26th of June, 1807, the powder magazine of Luxembourg, containing 28,000 pounds, was struck, and besides about 30 persons killed and 200 injured, the town was ruined. Explosions and large fires, involving a great loss, have become rather frequent in this country, owing to the iron tanks used for the storage of petroleum being struck by lightning. From March to August, in 1876, over 10,000,000 gallons, and on April 19, 1877, over 2,000,000 gallons of oil, and the village of Troutman, were destroyed in the oil regions of Pennsylvania.

During Aug. 14, 15, and 16, 1872, portions of New York State and the New England States were visited by some of the most terrific thunder-storms ever experienced, during which over 200 dwellings were struck and damaged, about 10 persons were instantly killed, and 160 stunned. One of these storms occurred at midnight, at Arlington, Mass., Aug. 14., in which brilliant streams of electricity darted across the sky in every direction, and the thunder which followed was constant for a period of thirteen minutes, without the intermission of an instant of silence. Three hundred and thirty-one discharges were counted in seven minutes by an observer; and each discharge was followed by loud and sometimes rattling reports, whose reverberations rolled through the heavens in an endless procession of majestic and terrific sounds.

In the States of Illinois and Iowa, and the prairie country west of the Mississippi River, thunder-storms are generally more terrific, and more lives have been lost there from the effects of lightning than in any other section of this country. Owing to the said country being level and devoid of trees, the equilibrium between the electricity of the atmosphere and that of the earth is principally restored by disruptive discharges. — *Spang's "Treatise on Lightning Protection."*

THE METRIC SYSTEM.

AT the meeting of the Boston Society of Civil Engineers, last week, it was voted to send the following memorial to Congress: —

To the Honorable the Senate and the House of Representatives of the United States, in Congress assembled, —

The memorial of the Boston Society of Civil Engineers respectfully showeth: That the incongruous weights and measures which have been in general use by this nation since its birth are inconvenient in computation, ambiguously named, and irregular in their ratios one to another; whereas the metric system which was legalized in the United States in 1866, and has been adopted by nearly all the governments of Europe and America, has decimal subdivision like the federal coinage, a uniform nomenclature, and very simple relations between its several units.

That the following-named seventeen organizations have assured your memorialist of their co-operation in petitioning your honorable body to make the metric standards, after some date, to be fixed several years in advance, — viz., Boston Society of Medical Science; Boston Society for Medical Observation; the Belles Lettres Society of the Illinois Wesleyan University, Bloomington, Ill.; St. Joseph's Medical Association, St. Joseph, Mo.; St. Louis Medico-Chirurgical Society; New England Association of Gas Engineers; Boston Homœopathic Medical Society; Engineers' Club of St. Louis; San Francisco Microscopical Society; Middlesex Mechanics' Association, Lowell, Mass.; St. Louis Medical Society; Alameda County Medical Association, Oakland, Cal.; Chamber of Commerce, Richmond, Va.; Mt. St. Mary's Seminary of the West, Cincinnati, O.; New Haven Medical Association; Massachusetts Medical Society.

That the following resolution was proposed in the forty-fourth Congress, as appears from the Congressional Record for May 8, 1876, but was never voted upon: —

"*Resolved*, That the heads of the executive departments of the government be, and they are hereby, requested to report to this house, at as early a date as practicable, what objections, if any, there are to making obligatory in all governmental transactions the metrical system of weights and measures, whose use has been authorized in the United States by act of Congress, and also how long a preliminary notice should be given before such obligatory use can be introduced without detriment to the public service; and that they are also requested to state what objections there are, if any, to making the metrical system obligatory in all transactions between individuals, and what is the earliest date that can be set for the obligatory use of the metrical system throughout the United States."

Your memorialist therefore prays for the adoption by your honorable body of the said proposed resolution.

NEW PUBLICATIONS RECEIVED.

THE METRIC SYSTEM of Weights and Measures. By J. Pickering Putnam, architect. Boston: American Metric Bureau, 1877.

CABLE MAKING for Suspension Bridges. By Wilhelm Hildebrand, C.E. New York: D. Van Nostrand, 1877.

REPORT of the International Conference on Education, held at Philadelphia, July 17 and 18, in connection with the International Exhibition of 1876.

THE FRENCH EXHIBITION OF 1878. — The Paris Universal Exhibition Building for the exhibition of 1878 is being pushed rapidly to completion by the French Government, and already has a grand appearance. The Great Hall is completed up to the springing of the iron roof trusses, and more than three-quarters of the iron and glass roofing over the industrial galleries on the Champ de Mars has been completed. In the centre of the building is a wide open air avenue, in which will be placed the fine-art galleries. It was at first thought that there would be no necessity for annexes; but the idea has been given up, and the Champ de Mars will be more crowded with supplementary buildings than it was in 1867. Half of the space of the Grand Vestibule will be used for the exhibition of the presents received by the Prince of Wales during his visit to India.

NOTES AND CLIPPINGS.

THE DARIEN CANAL. — Lieut. Wyse, leader of the French expedition to examine the isthmus, has returned, and reported results. He favors the scheme of cutting a direct canal in a straight line, south of the Panama Railway, from the Chucunaque, north-east to Port Gande, which he asserts can easily be done, the ground being completely level, and presenting only relatively narrow masses of earth to be removed, should it be decided to form a tunnel. He thinks that an inter-oceanic canal, and that by way of Colombia, will soon and easily be made, and calculates that the cost will not exceed 3,000,000 per kilomètre, which is 0.6214 of an American mile. The French survey at the close of 1876 was made with the permission, and even the co-operation, of the government of Colombia; and because the central government of Bogota had granted in 1867 certain privileges of canalization to the Panama Railway Company as far as the line which joins Cape Tiburon to Garachine Bay, it was only to the south of this line that new explorations could be made, under an authorization granted to the French association in May, 1876, by the government of Colombia. Viscount de Lesseps, who constructed the Suez Canal, is understood to be the advising engineer of the French Darien Canal Association.

LONGEST TUNNEL IN AMERICA. — Few people know how great an engineering enterprise is going on in Baltimore County. For one thing alone, a tunnel six and four-fifths miles long, 36,510 feet, is being built underground, for over four-fifths of the distance through hard gneiss and granite. It will be the longest tunnel in the country, and there will be only two larger in the world, — Mont Cenis, which is eight miles in length, and the St. Gothard now in process of construction, which is to be nine and a quarter miles. The fact that the water supply tunnel lies near enough to the surface to allow of numerous shafts, greatly facilitates its construction. The tunnel is a circle twelve feet in diameter, and extends from the Gunpowder River, about eight miles from the city, to Lake Montebello, the distributing reservoir near the Harford turnpike, about one mile and a half from the city, the direction being twenty degrees west of south. This tunnel will conduct the water from the Gunpowder River to Lake Montebello. Thence a conduit 4,120 feet long, known as the Clifton tunnel, from the fact that it passes under a portion of Clifton Park, conducts the water to a point just south of the Harford road, where it enters six mains, each four feet in diameter, which convey the water to the city, a distance of 1,900 feet. The country along the line of the works is hilly, and the tunnel varies in depth below the surface from 67 to 353 feet. There are fifteen shafts in the main tunnel, the deepest extending 294 feet below the surface. The water rains down from the crevices of the rocks, and pours along the bottom of the drift. The work of the tunnelling is all done by hand, it being cheaper than the machine-work in a drift of such narrow diameter. — *Real Estate Reporter.*

WATER WORKS. — The Columbus, Ohio, water-works, which are upon the Holly system, have now been in operation about seven years. Since they were built, the city has abandoned the use of their entire force of steam fire-engines, and the losses by fire have been decreased from an average, previous to the introduction of the water supply, of 65-100 of one per cent to 9-100 of one per cent upon the total tax valuation, while since 1870 the valuation of taxable property has increased, in round numbers, from $16,000,000 to $27,000,000 in 1876. The average daily amount of water now being pumped is about 1,600,000 gallons; the machinery with which the works are supplied being capable of furnishing 10,000,000 gallons daily for domestic use, or 7,000,000 gallons under fire pressure. There are now in use in the city upwards of 600 improved water-meters, from the Eagle Meter Co., of Brooklyn, L.I., which are recommended by the engineer in his report as giving better satisfaction than any meter yet tested. Since their introduction, three years ago, the consumption has but slightly increased, notwithstanding the growth of the city. There are about 45 miles of cast-iron pipe laid, in connection with the works, which was furnished by H. R. Smith & Co., of Columbus; to the credit of which establishment it may be said that not a single length has thus far been obliged to be taken up from any faultiness of the pipe. — *Engineering News.*

SIEMEN'S ELECTRIC LIGHT. — By experiments with Siemen's electric light in New York lately, an illumination was produced so intense that the eye was dazzled in looking at it across the East River. The electricity is produced by a powerful battery, worked by steam, and which makes seven hundred revolutions a minute. It is conducted to the lamps by two wires, having on each end a carbon point. When these are joined, there results a dazzling white light. The heat generated by the electricity was sufficient to melt a piece of glass in about six seconds.

THE PARIS OPERA-HOUSE. — The façade of the Paris Opera-House is to be illuminated during the evening by electric light thrown upon it by the Denagrouse process.

ELECTRIC LIGHT. — The city of Exeter, Eng., has delayed completing the purchase of gas-works in the hope that before long it may be able, thanks to the progress now making in the electric science, to light the city by electric light.

THE MEYERBEER PRIZE. — Ephraim Keyser, a sculptor of Baltimore, has been awarded the Meyerbeer prize at Berlin. This prize was instituted by a brother of the composer, and is given each year alternately to the best painter and sculptor of the Jewish race throughout the world.

MR. ADAM SCOTT pithily says that "a water-closet may be considered a kind of life-annuity to the nearest plumber."

AN IRON CONCERT HALL. — A novel building is just built at Carnarvon, North Wales, for the purpose of supplying Carnarvon with a suitable public hall, large enough to accommodate at least 6,000 persons. The pavilion is the largest public hall in the principality, being 200 feet long and 100 feet wide. It is built in three spans or bays, 34 feet high to square, and 54 feet high to the apex of the ventilator. The main roof is carried by wrought iron principals; rafters of T-iron, and ties, strut-rods, and braces of round iron. The principals are supported by cast-iron columns, having ornamental caps, and cantilever brackets, springing from the square part of the column. The lean-to roofs are supported by timber rafters, struts, and tie-beams resting upon brackets cast on columns to receive the same, and upon the side framing, which is of timber, as in the gable end framing. The roof, sides, and ends throughout are boarded, stained, and varnished; and on the boarding is laid a layer of non-conducting, inodorous felt, to prevent the possibility of draught and to render the acoustic properties of the building more complete. Galleries extend along almost the whole length of each side, supported by timber beams, bearers, and struts; wide pitch-pine staircases leading to and from the galleries to the level of the floor, and the galleries being protected along the front, by an elaborate ogee section railing of suitable design in cast iron. The exterior of the pavilion is entirely covered with galvanized corrugated iron. The lighting of the building is arranged by means of segment and other lights at each end of the hall; at the sides by continuous lights along the main and lean-to eaves, and by circular-headed French casements; the latter of which are all made to open for ventilation, and a continuous ventilator also runs along the entire length of the main roof.

CHURCH IN PHILADELPHIA. — The new Reformed Episcopal Church at Chestnut and Aspen Streets has a front of 85 feet on Chestnut Street, and a depth of 140 feet on Aspen Street. The main front is of light gray Ohio sandstone, and the sides of pressed brick, with stone dressings. The building has two entrances on Chestnut Street, and one on Aspen. The audience-room is 68 feet wide, exclusive of a recess at the pulpit, and 95 feet in length, with recesses at each end of 16 feet additional, and 50 feet in height. The roof is in one span, with no supports to obstruct the view from any point The interior is ornamented by coupled Ionic pilasters; and the ceiling is coved up to a height of ten feet, the remainder being flat and ornamented with projecting ribs. The pedestals under these pilasters are of Marezzo marble, which is used to form the wall-lining of the pulpit recess. The pulpit is on the longest side of the building, and around it the pews are arranged in concentric circles, sloping up gradually as they recede from it. Opposite the pulpit, and extending around three sides of the room, is the gallery, at its lowest point twelve feet above the floor below, its shape coinciding with the curvature of the pews. The interior woodwork is of walnut and ash, the walls being wainscoted with black walnut panelling. The principal feature of the main front is the tower, which is 25 feet square at the base, and is carried up 120 feet, with a belfry stage at the top entirely of stone. The main entrance vestibule has supporting columns of stone 2½ feet in diameter, coupled on either side of the doorway. The seating capacity of the building is about 1,000.

SUPERHEATED STEAM. — Bradley's Promether consists of a generator which is a tremendously strong iron box about three feet square (for 35 horse-power), in which are arranged a series of bulbs somewhat like those in Harrison's safety boiler, but put together more strongly and with special care to make tight joints. A pump throws the water, which is disintegrated into the form of an extremely fine mist like the spray of perfume thrown from the bottle by being forced through a small hole by squeezing a rubber bulb. The bulbs in the generator at the time the spray is thrown are heated to a dull red heat. At a test the generator marked a pressure up to 4,000 pounds per square inch; and even at this, so perfect was every joint that there was no leakage. The great end that is claimed to be accomplished by this invention is economy in fuel, and the adaptability of the new motor to any existing form of the engine. Its saving in fuel is claimed to arise from the immense pressure which can be distributed by cutting off the motor from the cylinder at an early part of the stroke. Thus, if an engine had a cylinder of 20-inch stroke, working at 100 pounds pressure, and cutting off at one-half stroke, by using the motor at 500 pounds pressure, it can be cut off at one-tenth of the stroke, and at the same time, owing to the increased initial velocity, show greater indicated horse power."

SURFACE DRAINAGE. — A Philadelphia newspaper (the *Press*) thus finds fault with Philadelphia drainage: — "It is strange that while in England, in all the towns, large and small, the refuse waters of houses are carried off under ground, in this city surface drainage should be so obstinately adhered to. It is condemned by sanitary authorities as prejudicial to the public health, if not in the same degree as open sewers, yet to some extent as much so. The street-gutters are badly constructed. Few of them, except in heavy rains, have any flow; and in hot weather, the stagnated pools that form in them throw off very offensive odors. Open sewers are breeders of disease, and street-gutters are also recognized malarious agents. That so beautiful a city as Philadelphia should be defiled with filthy drainage flowing on the surface of its streets, surprised the visitors to the Centennial Exhibition, and the more so, as in Boston, Washington, and most of the Western cities, subterranean drainage to the common sewers is now adopted. The superior purity of the atmosphere and the greater cleanliness of the streets in the newer portions of the city, where surface-drainage is done away with, must strike every one. The reform should be made universal throughout."

THEATRE. — A new theatre was opened at Cork, Ireland, Sept. 17. The building was designed by Mr. Phipps, F.S.A. The depth of the theatre from the curtain to back of pit is 69 feet; the stage is 48 feet deep, and the proscenium is 30 feet wide.